

PATENT COOPERATION TREATY

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From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

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ÉRKEZETT

2005-04-04

DANUBIA
Szabadalmi és Védjegy Iroda Kft.

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year)

22.03.2005

Applicant's or agent's file reference
99593-2967/LT

IMPORTANT NOTIFICATION

International application No.
PCT/HU 03/00079

International filing date (day/month/year)
07.10.2003

Priority date (day/month/year)
07.10.2002

Applicant
MOL HUNGARIAN OIL AND GAS CO. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Corrected version: See basis of report: claims

Name and mailing address of the International
preliminary examining authority:



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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 99593-2967/LT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/HU 03/00079	International filing date (day/month/year) 07.10.2003	Priority date (day/month/year) 07.10.2002
International Patent Classification (IPC) or both national classification and IPC E21B37/06		
Applicant MOL HUNGARIAN OIL AND GAS CO. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

I	<input checked="" type="checkbox"/>	Basis of the opinion
II	<input type="checkbox"/>	Priority
III	<input type="checkbox"/>	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV	<input type="checkbox"/>	Lack of unity of invention
V	<input checked="" type="checkbox"/>	Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI	<input type="checkbox"/>	Certain documents cited
VII	<input type="checkbox"/>	Certain defects in the international application
VIII	<input type="checkbox"/>	Certain observations on the international application

Date of submission of the demand 06.05.2004	Date of completion of this report 22.03.2005
Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016 </div> </div>	Authorized Officer Smalt, R Telephone No. +31 70 340-4275



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**International application No. **PCT/HU 03/00079****I. Basis of the report**

1. With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17):*

Description, Pages

1-24 as originally filed

Claims, Numbers

1-18 filed with telefax on 14.01.2005

Drawings, Sheets

1/11-11/11 as originally filed

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**International application No. **PCT/HU 03/00079**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).
(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-18
	No: Claims	
Inventive step (IS)	Yes: Claims	1-18
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-18
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application PCT/HU 03/00079

Re: V

In response to the written opinion, the claims have been amended to include a specific group of viscosity-increasing compound. The application provides basis for such amendment, and it renders the claims novel in accordance with Art.33(2) PCT.

The application further shows an unexpected effect in that the treated oil installations require less frequent treatment than was previously necessary in the art. An inventive step in accordance with Art.33(3) PCT can therefore be acknowledged.

Industrial applicability has never been contested, and goes without saying.

The applicant has filed deposit receipts for the claimed bacterial strains to verify compliance with the disclosure requirements under the Budapest treaty.

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Annex 1

(47)

Amended Claims:

- 5 1. Method for the removal of asphaltene-paraffin-wax precipitates and prevention of formation thereof on surfaces in contact with crude oil, comprising
- a) adding tensides, biodegradable macromolecular polymeric materials for increasing viscosity, and microorganisms capable of breaking down crude oil components or derivatives and producing at least one type of tenside, to the surface, optionally together with additives required for the reproduction of said microorganisms;
- 10 b) providing an appropriate temperature for the microorganisms after the addition of the materials in step a);
- c) allowing the microorganisms to reproduce and act for a predetermined period of time on the surface;
- 15 d) checking the results of the treatment; and
- e) optionally repeating steps (a) to (d) at least once more, preferably at least three more times,
- thereby forming a film carrying bacteria on the surface in contact with the crude oil.
2. The method according to claim 1, wherein said biodegradable macromolecular material for increasing viscosity is Supramil, xanthan, or other water soluble macromolecule, such as starch, cellulose derivative, and preferably xanthan.
- 20 3. The method according to claim 1 or 2, wherein the said precipitates are removed from or prevented in the inner surfaces of tubings of oil-wells, flow lines thereof, or in oil pipelines.
4. The method according to claims 1 to 3, wherein the said microorganisms and additives are added to the surface at the same time, in the form of an aqueous suspension.
- 25 5. The method according claim 4, wherein the suspension of microorganisms contains 10^6 to 10^{12} CFU/liter, preferably 10^7 to 10^{11} CFU/liter, more preferably 10^8 to 10^9 CFU/liter.
6. The method according to claim 4 or 5, wherein the volume of the suspension is 100 to 1000 liter/100 m pipe-length, preferably 300 to 800 liter/100 m pipe-length, more preferably
- 30 500 to 600 liter/100 m pipe-length.
7. The method according to claim 6, wherein the microorganisms are allowed to reproduce and act for 1 to 15 days, preferably for 6 to 8 days, while the pipes are kept closed.
8. The method according to claims 3 to 7, performed in a production oil-well, and the temperature in the well is determined by the geological conditions.

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9. The method according to claims 3 to 8, wherein the results of the treatment are checked by pilot test and by mechanical cleaning test and/or by evaluating the physico-chemical properties, preferably the decrease of viscosity of an oil sample and/or evaluating the drop-size of the asphaltene-paraffin-vax precipitates in an oil-sample by microscopy.

5 10. The method according to claims 1 to 9, wherein the surfactant is selected from the group consisting of polyoxyethylene ethers and esters, and mixtures thereof, preferably Tween 80.

11. The method according to claims 1 to 10, wherein the asphaltene-paraffin-vax precipitates are removed from the surface in advance by mechanical means.

10 12. Use of biodegradable macromolecular polymeric material for increasing viscosity and a microorganism capable of breaking down crude oil components or derivatives and producing at least one type of tenside for the removal and prevention of asphaltene-paraffin-vax precipitates by way of forming a film carrying bacteria on surfaces in contact with crude oil.

15 13. The use according to claim 12, wherein the biodegradable macromolecular material for increasing viscosity is Supramil, xanthan, or other water soluble macromolecule, such as starch, cellulose derivative, and preferably xanthan.

14. The use according to claim 12 or 13, wherein the microorganism is a strain belonging to the *Bacillus subtilis* species, the *Bacillus cereus* species, the *Pseudomonas* genus or the *Xanthomonas* genus, and preferably facultative anaerobic.

20 15. The use according to any one of claims 12 to 14, wherein the microorganism is selected from the group consisting strains NCAIM (P) B 1304, NCAIM (P) B 1305, NCAIM (P) B 1306, NCAIM (P) B 1307 and NCAIM (P) B 1308 deposited on April 17, 2002 at NCAIM, or any strain derived therefrom, and preferably is a strain that is genetically modified, more preferably modified by the insertion of a DNA fragment with a known sequence as a marker.

25 16. Kit for the removal or prevention of asphaltene-paraffin-vax precipitates on surfaces in contact with crude oil in pipelines, comprising a microorganism useful in the method of claim 1, biodegradable macromolecular polymeric material for increasing viscosity, and further comprising instructions to carry out the method of any of claims 1 to 11.

30 17. The kit according to claim 16, wherein the biodegradable macromolecular material for increasing viscosity is Supramil, xanthan, or other water soluble macromolecule, such as starch, cellulose derivative, and preferably xanthan.

18. The kit according to claim 16 or 17, comprising one or more of the microorganisms defined in any of claims 12 to 15 and additives necessary for the reproduction thereof.